

# Installing NaturalX under OS/390

This document describes step by step how to install NaturalX under OS/390.

The following topics are covered:

- Prerequisites
- Installation Tape for NaturalX under OS/390
- Installation Procedure for NaturalX under OS/390

For further information on NaturalX, see the NaturalX documentation.

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## Prerequisites

### Software

- OS/390 Operating System  
Version as specified under Operating/Teleprocessing Systems Required in the current Natural Release Notes.
- EntireX DCOM  
Version as specified under Natural and Other Software AG Products in the current Natural Release Notes.
- OS/390 UNIX Services with access to the OS/390 HFS (hierarchical file system)

### Knowledge

Before you start installing NaturalX under OS/390, it is important that you have a clear picture of the NaturalX system architecture under this operating system; see NaturalX System Architecture under OS/390 (in the NaturalX documentation).

# Installation Tape for NaturalX under OS/390

The installation tape contains the datasets listed in the table below. The sequence of the datasets is shown in the **Report of Tape Creation** which accompanies the installation tape.

Dataset Name	Contents
NXNnnn.LOAD	Natural load modules
NXNnnn.JOBS	Sample installation jobs and sample configuration files

The notation *nnn* in dataset names represents the version number of the product.

## Copying the Tape Contents to Disk

If you are not using SMA:

Copy the job dataset NXXnnn.JOBS from tape to disk using the sample JCL below.

The following values must be supplied in the JCL:

1. In the dataset names, replace *nnn* with the current version number of the datasets.
2. With the SER parameter, replace XXXXXX with the volume serial number of the tape .
3. With the LABEL parameter, replace *x* with the sequential number of the tape dataset (see the **Report of Tape Creation**).
4. With the VOL=SER parameter, replace YYYYYY with the volume serial number of the disk pack.

```
// JOB CARD
//V2COPY EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=A
//IN1 DD DSN=NXXnnn.JOBS,DISP=OLD,UNIT=TAPE,
//      // VOL=(,RETAIN,SER=XXXXXX),LABEL=(x,SL)
//OUT1 DD DSN=SAGLIB.NXXnnn.JOBS,DISP=(NEW,CATLG,DELETE),
//      // UNIT=SYSDA,VOL=SER=YYYYYY,SPACE=(CYL,(1,1,10))
//SYSIN DD *
C I=IN1,O=OUT1 /*
```

Adapt and run job NXXTAPE from the job dataset to copy the load and source libraries from tape to disk.

The sample jobs directly use the sequential datasets from tape.

The dataset type and the space each dataset requires on disk are shown in the **Report of Tape Creation**.

# Installation Procedure for NaturalX under OS/390

The NaturalX distribution tape contains the following load modules:

- NATCOMST
- NATCOM
- NATURALX
- NATXMON

## Step 1: Create directory file structure in the HFS.

(Job I009, Step 8500)

Create the following directories in your OS/390 HFS (hierarchical file system):

- \$SAG/\$NATDIR/\$NATVERS/etc
- \$SAG/\$NATDIR/\$NATVERS/bin
- \$SAG/\$NATDIR/\$NATVERS/trace/client
- \$SAG/\$NATDIR/\$NATVERS/trace/server

The following is an example of how to do this:

```
cd $sag
mkdir nat
cd nat
mkdir vnnn
cd vnnn
mkdir etc
mkdir bin
mkdir trace
mkdir trace/client
mkdir trace/server
```

The directory names must be in lower case.

## Step 2: LinkEdit files into the HFS.

(Job I009, Steps 8502, 8503)

LinkEdit the files NATURALX and NATXMON into the \$SAG/\$NATDIR/\$NATVERS/bin directory in your HFS system as shown in the following example:

```

//***** JOB/STEP NXX311 I009 8502
//*
//*
//** LINK MODULE NATURALX INTO HFS STRUCTURE
//** LINK-INPUT FROM SYSLIN
//*
//LKD8502 EXEC PGM=IEWL,
// PARM=( 'RENT,REUS,XREF,LET,LIST,NCAL,CASE=MIXED',
// 'SIZE=(1024K,128K)' )
//SYSLMOD DD PATH='/u/sag/nat/vnnn/bin',
// PATHOPTS=(OWRONLY,O_CREAT,O_TRUNC),
// PATHMODE=(SIRWXG,SIRWXU)
//NATLOAD DD DISP=SHR,DSN=PQR.NXXnnn.LOAD
//SYSUT1 DD UNIT=3380,SPACE=(1700,(500,100))
//SYSPRINT DD SYSOUT=*, 
// DCB=(RECFM=FB,LRECL=121,BLKSIZE=1210)
//SYSLIN DD *
INCLUDE NATLOAD(NATURALX)
NAME naturalx
/*
//** LINK MODULE NATURALX INTO HFS STRUCTURE
//** LINK-INPUT FROM SYSLIN
//*
//LKD8502 EXEC PGM=IEWL,
// PARM=( 'RENT,REUS,XREF,LET,LIST,NCAL,CASE=MIXED',
// 'SIZE=(1024K,128K)' )
//SYSLMOD DD PATH='/u/sag/nat/vnnn/bin',
// PATHOPTS=(OWRONLY,O_CREAT,O_TRUNC),
// PATHMODE=(SIRWXG,SIRWXU)
//NATLOAD DD DISP=SHR,DSN=PQR.NXX311.LOAD
//SYSUT1 DD UNIT=3380,SPACE=(1700,(500,100))
//SYSPRINT DD SYSOUT=*, 
// DCB=(RECFM=FB,LRECL=121,BLKSIZE=1210)
//SYSLIN DD *
INCLUDE NATLOAD(NATXMON)
NAME natxmon
/*
//*

```

## Step 3: Define environment variables.

(Job I009, Steps 8510, 8511)

- With System Maintenance Aid (SMA):
 

Job I009 with Steps 8510 and 8511 is generated to create NATENV and NATXENV source members in the SMA library.
- Without SMA:
 

Define the required environment variables by modifying the following PDS members in NXX nnn.JOBS:

Member	Description
NATENV	Shell startup profile
NATXENV	NaturalX environment file

For information on System Maintenance Aid (SMA), see also Using Installation Jobs Generated by System Maintenance Aid in the section General Installation Information.

For information on environment variables, see the section NaturalX System Architecture under OS/390 and the subsection Environment Variables (in the NaturalX documentation).

#### **Step 4: Copy the configuration files into HFS.**

(Job I009, Steps 8530)

The following is a sample job for copying the configuration files into HFS:

```
//***** JOB/STEP NXXnnn I009 8530
/*
/*
/* PASS SHELL COMMANDS TO OE
/*
//PASS8530 EXEC PGM=IKJEFT01
//SYSTSPRT DD SYSOUT=*
//SYSTSIN DD *
OPUT 'SAG.NXXnnn.JOBS(NATENV)'
'/u/sag/nat/vnnn/natenv'
TEXT
OPUT 'SAG.NXXnnn.JOBS(NATXENV)'
'/u/sag/nat/vnnn/natxenv'
TEXT
OPUT 'SAG.NXXnnn.JOBS(RMB)'
'/u/sag/nat/vnnn/rmb'
TEXT
/*
/*
// * **** END OF SMA-JOB D009I009 *****
```

#### **Step 5: Set permissions for the RMB script.**

(Job I009, Step 8538)

This step performs the shell command 'chmod 777 on script RMB'.

#### **Step 6: Remove blank characters from the members NATENV and NATXENV.**

(Job I009, Steps 8540, 8542)

The RMB (ReMove Blanks) script is executed to remove the blanks at the end of each line in NATENV and NATXENV.

#### **Step 7: Add environment variables.**

Append the required environment variables from 'natenv' to your shell startup profile '.profile' using the following command:

```
cat $NATDIR/$NATVERS/natenv >> <path>/.profile
```

**Step 8 : Assemble the Natural OS/390 interface module with the option LE370=POSIX.**

(Job I055, Steps 8510, 8520)

Job I055, Step 8510 starts the batch program IEBUPDATE.

Job I055, Step 8520 assembles and links NATOS.

**Step 9: Define an NTBPI entry for your DCOM buffer pool in NATPARM and assemble.**

(Job I060, Steps 8510, 8520)

Create the Natural batch parameter module with the necessary parameters for NaturalX (NTBP entry).

Job I055, Step 8510 starts the batch program IEBUPDATE.

Job I055, Step 8520 assembles and links NATPARM.

**Step 10: Adapt the SVC number and the 'rent' flag in the source of ADALNK in your Adabas source library.**

You do this by setting the 'rent' flag in the ADALNC source to '1'.

**Step 11: Assemble and link ADALNK Job/Step NXXnnn.**

(Job I055, Step 8501)

Link ADALNK using the RENT option.

**Step 12: Relink your Front-end with the new NATPARM and driver.**

(Job I060, Step 8530)

Link the Natural nucleus using the re-entrant ADALNK created in Step 11.

**Step 13 - optional: Create a CLIST for your sample Natural TSO client.**

(Job I070, Step 8500)

Create the CLIST to call your sample NAT /TSO client which will be created with the following steps.

**Step 14 - optional: Assemble and link NAT/TSO interface.**

(Job I070, Steps 8515, 8520)

Assemble and link the NAT/TSO interface with option LE370=POSIX.

**Step 15 - optional: Link Natural TSO nucleus.**

(Job I080, Steps 8510, 8515, 8520)

Assemble and link NATPARM. Link your NAT/TSO nucleus using the re-entrant ADALNK created in Step 11.